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| 10/829,144 | 04/21/2004 | Anthony M. Mazany | 56181.5500 | 5093 |

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| EXAMINER | |
|---|---|
| TUROCY, DAVID P | |
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| 1792 | |

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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

| Office Action Summary | Application No. | Applicant(s) | |
|---|---|---|---|
| | 10/829,144 | MAZANY ET AL. | |
| | Examiner | Art Unit | |
| | DAVID TUROCY | 1792 | |

*-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --*

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

1)☒ Responsive to communication(s) filed on *17 April 2009*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

4)☒ Claim(s) *1,3,4,8-25,57 and 59-66* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,3,4,8-25,57 and 59-66* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

**Application Papers**

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

## DETAILED ACTION

### *Continued Examination Under 37 CFR 1.114*

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 4/17/09 has been entered.

### *Response to Amendment*

2. Applicant's amendments, filed 4/17/2009, have been fully considered and reviewed by the examiner. The examiner notes amendment to claims 1, the cancellation of claims 2 and 26-56, and the addition of new claims 62-66. Claims 1, 3-4, 8-26, 57, 59-66 are pending in the instant application, with claims 28-56 withdrawn due to a restriction requirement.

### *Response to Arguments*

3. Applicant's arguments filed 4/17/2009 have been fully considered but they are not persuasive.

In response to the applicant's amendment regarding positively reciting the "imparting hydrolytic stability", the examiner, after a thorough review of the applicants specification notes the prior art will necessarily have this feature. The examiner notes

the statements of fact in the applicant's specification, see page 11, lines 26-27, which states "In general, the hydrolytic stability of the metal-phosphate network increases as the metal content increases." This statement provides sufficient evidence to support the examiners position that the oxidation inhibiting composition as taught by the prior art will provide the claimed benefits because the prior art discloses a similar composition that has a metal and phosphate ratio and thus must have some degree of hydrolytic stability, and any degree of hydrolytic stability will meet the claimed limitations as written. The claims fail to appreciate any unexpected degree of hydrolytic stability or any unexpected benefits of the hydrolytic stability, but merely that there exists some degree of hydrolytic stability. Therefore, absent a commensurate showing of unexpected results by factual evidence, the mere observation of still another beneficial result of an old process cannot form the basis of patentability. *Allen et al. v. Coe*, 57 USPQ 136; *In re Maeder et al.* 143 USPQ 249.

Additionally, the applicants have argued that the presently claimed invention provides unexpected benefits of imparting hydrolytic stability, specifically stating "applicants have unexpectedly discovered that such significantly lower metal to phosphate atomic ratios provide a beneficial level of hydrolytic stability." However, the examiner notes that this statement is not supported by factual evidence and is therefore not commensurate in scope with the claims. The unexpected impartation of "hydrolytic stability" over the entire scope of the claims as broadly written are merely allegation, unsupported by any factual evidence. Additionally, the claims only require some degree of hydrolytic stability, not some unknown and unquantified "beneficial level" and it

remains the examiners position that the process as taught by the prior art inherently provides some level of hydrolytic stability and therefore meets the claimed limitations.

The applicant argues against the Stover reference, stating that the reference does not disclose a composition that includes one or more of the metals as claimed. However, as discussed in the office action dated 7/16/2008, Stover clearly discloses contacting the carbon-–carbon composite with an oxidation inhibiting composition (see Column 13, lines 38 – 40) comprising phosphoric acid, at least one aluminum salt, and at least one additional metal salt (zinc salt; see Column 13, lines 42 – 44). Stover discloses the metal salt can be any zinc salt, including zinc chloride, zinc nitrate, and zinc phosphate (Column 3, lines 55-60), wherein zinc chloride or nitrate meet the requirements of the claim.

In response to applicant's arguments against the references individually, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.,* 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986).

Applicant's arguments directed at the combination of Stover and Block are not persuasive. The applicant argued against the Block reference stating there is no suggestion of combine the teachings with Stover. However, initially, the examiner notes that suggestion to combine is only one test of obviousness. See *KSR Int'l Inc. v. Teleflex Inc.*, 127 S Ct. 1727, 1741, 82 USPQ2d 1385, 1396 (2007). Additionally, the examiner notes that Stover discloses a method of including zinc salt and aluminum salt

and Block discloses zinc and magnesium salts provide carbon composites that are especially resistant to oxidation at elevated temperatures. Therefore, taking the references collectively, it would have been obvious to one of ordinary skill in the art to have modified Stover, to utilize magnesium salt, particularly magnesium nitrate, with a reasonable expectation of predictably providing a carbon-carbon composite that has oxidation resistance. A predictable use of prior art elements according to their established functions to achieve a predictable result is prima facie obvious. See *KSR Int'l Inc. v. Teleflex Inc.*, 127 S Ct. 1727, 1741, 82 USPQ2d 1385, 1396 (2007).

Additionally, as evidenced by Block at Table I, magnesium nitrate is a known substitute for oxidation resistance with zinc chloride or zinc nitrate, and the claim would have been obvious because the substitution of one known element for another would have yielded predictable results to one of ordinary skill in the art at the time of the invention.

The applicant argues that the Block reference teaches away from combining metal cations with phosphorous acid or metal phosphates. However, the examiner notes that such is explicitly taught by Stover, combining phosphorous acids with metal cations and aluminum. Therefore, since the rejection is based on the combination of references and the references, taken collectively, suggest modifying Stover to include magnesium salts in substitute of zinc because Block teaches zinc and magnesium salts provide carbon composites that are especially resistant to oxidation at elevated temperatures. Finally, a teaching of an improvement is not a teaching away because Block discloses that such is known and suitable in the art and remains operable. While

Block discloses inconsistent synthesis, such does not teach that the process is inoperable and thus is not a teaching away. Additionally, a teaching of a preferred embodiment is not a teaching away because such is not teaching of inoperability.

All other arguments not specifically addressed are unsupported by any factual evidence and are therefore deemed mere attorney speculation. Applicant's arguments must be considered mere attorney speculation not supported by evidence. *In re Scarborough*, 500 F.2d 560,566 182 USPQ 298,302 (CCPA 1974).

### *Claim Rejections - 35 USC § 103*

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5. Claims 1-4, 8-23, 25, 26, 27, 57, 59-61, 63-64 are rejected under 35 U.S.C. 103(a) as being unpatentable over by Stover (United States Patent 5,759,622) in view of Block (United States Patent 4,454,193) as evidenced by applicants specification.

Regarding Claim 1, Stover teaches a method of inhibiting oxidation of a porous carbon-carbon composite (see Column 13, lines 37 – 40) comprising the steps of: (a) contacting the carbon—carbon composite with an oxidation inhibiting composition (see Column 13, lines 38 – 40) comprising phosphoric acid, at least one aluminum salt, and at least one additional metal salt (zinc salt; see Column 13, lines 42 – 44), the oxidation inhibiting composition penetrating at least some of the pores of the carbon-carbon

composite (see Column 13, lines 40, 41, 45, and 46); and (b) heating the carbon-carbon composite at a temperature sufficient to form a deposit from the oxidation inhibiting composition within at least some of the penetrated pores of the carbon-carbon composite (see Column 13, lines 44 – 47). Stover discloses the metal salt can be any zinc salt, including zinc chloride, zinc nitrate, and zinc phosphate (Column 3, lines 55-60).

At the very least the examiner notes that Stover clearly discloses contacting the carbon—carbon composite with an oxidation inhibiting composition (see Column 13, lines 38 – 40) comprising phosphoric acid, at least one aluminum salt, and at least one additional metal salt (zinc salt; see Column 13, lines 42 – 44). Stover discloses the metal salt can be any zinc salt, including zinc chloride, zinc nitrate, and zinc phosphate (Column 3, lines 55-60), wherein zinc chloride or nitrate meet the requirements of the claim. Therefore at the very least, it would have been obvious to one of ordinary skill in the art to have selected a zinc salt, including zinc chloride or zinc nitrate because such are taught as equivalents for the same purpose and Rationale: The claim would have been obvious because the substitution of one known element for another would have yielded predictable results to one of ordinary skill in the art at the time of the invention. Stover teaches, in Column 13, lines 53 – 55, that "the zinc salt is selected from the group consisting of a zinc halide, a zinc nitrate, a zinc phosphate, and a mixture thereof." Therefore, as discussed by Stover, mixtures thereof, including zinc phosphate and zinc halide or zinc nitrate and such a situation would read on the claim as written because the claim includes comprising language the claims only require a solution

comprising “an additional metal salt”. Such language encompasses a mixture of the discloses metal salts and such would have been obvious to one of ordinary skill in the art because Stover discloses a list of possible metal salts and discloses mixture of such would provide predictable results.

Stover does not teach the method wherein the additional metal salt comprises an alkaline earth metal salt which comprises magnesium nitrate. Block teaches, in Column 9, lines 21 – 36, “a method for inhibiting the oxidation of a carbon body which comprises: (a) impregnating a porous carbon body with a solution of a metal salt ... (b) curing said impregnated carbon body ... and (c) calcining said cured carbon body ... wherein said cured carbon body is calcined at a temperature of from about 700 to about 950 C." Furthermore, Block teaches, in Column 5, lines 56 – 61, that “zinc and magnesium salts provide carbon composites that are especially resistant to oxidation at elevated temperatures. Thus, zinc and magnesium are even more preferred multi-valent cations. The most preferred salts for preparing the carbon composites of this invention are the magnesium salts.” Finally, Block also teaches, in Column 6, lines 3 – 6, that magnesium nitrate is a preferred such salt. Therefore, it would have been obvious to one having ordinary skill in the art at the time of the present invention to have modified the method taught by Stover by employing an additional metal salt that comprises magnesium nitrate in place of the zinc salt taught by Stover with a reasonable expectation of success, because Block teaches that zinc and magnesium salts are especially resistant to oxidation at elevated temperatures.

Taking the references collectively, it would have been obvious to one of ordinary skill in the art to have modified Stover, to utilize magnesium salt, particularly magnesium nitrate, with a reasonable expectation of predictably providing a carbon-carbon composite that has oxidation resistance. A predictable use of prior art elements according to their established functions to achieve a predictable result is prima facie obvious. See *KSR Int'l Inc. v. Teleflex Inc.*, 127 S Ct. 1727, 1741, 82 USPQ2d 1385, 1396 (2007). Additionally, as evidenced by Block at Table I, magnesium nitrate is a known substitute for oxidation resistance with zinc chloride or zinc nitrate, and the claim would have been obvious because the substitution of one known element for another would have yielded predictable results to one of ordinary skill in the art at the time of the invention.

Stover in view of Block does not explicitly state "imparting hydrolytic stability", however such is implicit in the composition as discussed in the Response to Arguments section, supra. Additionally, in other words, the combination of references makes obvious including a composition of phosphoric acid, aluminum salt and a alkali metal salt and the applicant's results are taught as being inherent to this composition and thus the prior art combination would necessarily result in the claimed advantages unless the applicant is doing other process steps that are not claimed in order to achieve the benefits. The mere observation of still another beneficial result, i.e. imparting a degree of hydrolytic stability, of an old process, i.e. application of an oxidation composition, cannot form the basis of patentability. *Allen et al. v. Coe*, 57 USPQ 136; *In re Maeder et al.* 143 USPQ 249.

Regarding Claims 2, 3 and 26, Stover teaches the method wherein the metal to phosphate atomic ratio for the oxidation inhibiting composition is adjusted to be about 0.35 by adding a metal salt to the oxidation inhibiting composition (see n Column 7, lines 15 – 20). Stover discloses the metal salt can be either zinc phosphate or zinc chloride. See Example 3, which clearly discloses zinc salt in a proportion as claimed, as discussed in the office action dated 2/26/2008. Additionally, see Column 3, lines 50-60, discussing an aluminum salt to zinc salt in a ratio of 2 to 1. Therefore, the ratio of the components is taught by Stover. Additionally, the examiner notes that Stover discloses ranges for metal salt to Aluminum salt (column 50-60), and In the case where the claimed ranges "overlap or lie" inside ranges disclosed by prior art a *prima facie* case of obviousness exists. *In re Wertheim*, 541 F.2d 257 191 USPQ 90. See MPEP 2144.05.

Alternatively, It is the examiners position that the amount of each component is known result effective variables. If the amount of metal salt or aluminum is too low or too low it would result in improper oxidation resistance. Therefore it would have been obvious to one skill in the art at the time of the invention was made to determine the optimal value for the zinc to aluminum ratio, including within the range as claimed used in the process of Stover, through routine experimentation, to impart the carbon-carbon composite with the desired properties associated oxidation resistance.

Regarding Claim 4, Stover teaches the method wherein the oxidation inhibiting composition further comprises water (see again Column 7, lines 15 – 20).

Regarding Claims 9 and 10, Stover in view of Block does not teach the method wherein the additional metal salt comprises magnesium phosphate. However, as discussed above, Stover teaches the method wherein the additional metal salt is zinc phosphate dihydrate, and Block teaches that zinc and magnesium salts provide carbon composites that are especially resistant to oxidation at elevated temperatures. Furthermore, Stover teaches, in Column 3, lines 58 – 61, that the zinc salt may be any zinc salt capable of forming zinc phosphate upon heating. Examples of zinc salts include zinc halides, ... zinc nitrate, zinc phosphate, and mixtures thereof." Therefore, it would have been obvious to one having ordinary skill in the art at the time of the present invention to have modified the method taught by Stover in view of Block by employing an additional metal salt that is a magnesium phosphate with a reasonable expectation of success, because Stover teaches that metal salts that are zinc nitrates, zinc halides, and/or zinc phosphates are known, and because Block teaches that zinc and magnesium salts both provide carbon composites that are especially resistant to oxidation at elevated temperatures. Additionally, as evidenced by Block at Table I, magnesium nitrate is a known substitute for oxidation resistance with zinc chloride or zinc nitrate, and the claim would have been obvious because the substitution of one known element for another would have yielded predictable results to one of ordinary skill in the art at the time of the invention.

Regarding Claims 14 and 15, Stover teaches the method wherein the aluminum salt comprises mono-aluminum phosphate (see previous citations).

Regarding Claims 16 and 17, Stover teaches the method wherein the oxidation inhibiting composition further comprises a wetting agent that comprises a polysiloxane (see Column 4, lines 9 – 62; Column 7, lines 53 – 56; and Column 13, lines 37 – 43 and line 63).

Regarding Claim 18, Stover teaches the method wherein the oxidation that is inhibited is a catalyzed oxidation (see again Column 1, lines 37 and 38).

Regarding Claim19, Stover teaches the method wherein the composite is heated during step (b) at a temperature in the range of about 640 to about 900 C (see Column 13, lines 48 – 51).

Regarding Claims 20 – 22, Stover teaches the method wherein a barrier coating is applied to at least one surface of the carbon-carbon composite prior to step (a), and wherein the barrier coating comprises silicon carbide (see Column 14, lines 1 – 4).

Regarding Claim 23, Stover teaches the method wherein the barrier coating is applied to the carbon-carbon composite using chemical vapor deposition (see Column 14, lines 5 and 6).

Regarding Claim 25, Stover teaches the method wherein the depth of penetration of the oxidation inhibiting composition into the pores of the carbon-carbon composite is about 4 mm (see Column 12, lines 20 – 22).

Regarding Claim 27, Stover does not explicitly teach the method wherein the metal to phosphate atomic ratio for the oxidation inhibiting composition is adjusted to be

in the range of about 0.26 to about 0.50 by adding a metal nitrate or a metal halide to the oxidation inhibiting composition. However, as discussed for Claims 2 and 26 above, Stover does teach the analogous method wherein the metal salt is a metal phosphate. Furthermore, Stover teaches, in Column 13, lines 53 – 55, that "the metal salt is selected from the group consisting of a metal halide, a metal nitrate, a metal phosphate, and a mixture thereof." Note that by replacing metal phosphate dihydrate with a metal halide or metal nitrate, assuming a desire to have the same amount of metal by mol in the composition, the elimination of the phosphate from the metal salt still results in an atomic ratio of metal to phosphate of approximately 0.4, within the range of about 0.26 to about 0.50. It has been held that, in the case where the claimed ranges "overlap or lie inside ranges disclosed by the prior art", a *prima facie* case of obviousness exists. *In re Wertheim*, 541 F.2d 257, 191 USPQ 90 (CCPA 1976); *In re Woodruff*, 919 F.2d 1575, 16 USPQ2d 1934 (Fed. Cir. 1990). Alternatively, if the 12 parts by weight of metal phosphate dehydrate were instead replaced with 12 parts by weight of metal nitrate, the metal to phosphate atomic ratio would be 0.35, still rendering the claimed range *prima facie* obvious. Moreover, it has been held that, “Where the general conditions of a claim are disclosed in the prior art, it is not inventive to discover the optimum or workable ranges by routine experimentation.” *In re Aller*, 220 F.2d 454, 456, 105 USPQ 233, 235 (CCPA 1955). Therefore, it would have been obvious to one having ordinary skill in the art at the time of the present invention to have modified the method taught by Stover in Examples 3 and 9 by utilizing a metal salt that is a metal halide or a metal nitrate as also taught by Stover to have achieved the same or a similar metal to phosphate atomic

ratio as taught in Examples 3 and 9 of Stover, because Stover teaches that the metal salt employed may be either a metal nitrate, a metal halide, or a metal phosphate, and because Stover teaches the general conditions of such a method.

Claim 57: Stover discloses contacting selected regions of the composite with the composition (Column 6, lines 15-30).

Claims 59-61: Stover in view of Block does not teach the requirements of the composition resistant to moisture and reduces the treated carbon-carbon composite sensitivity to reduction in friction. However, Stover teaches each and every process step and limitation of the applicant's claims, including a composition comprising phosphoric acid, aluminum salt and a zinc salt that is not a zinc phosphate applied to a carbon-carbon composite for inhibiting oxidation and heating to a temperature to form a deposit. Since the features as claimed by the applicant's claimed process is simply a function of the composition applied to the carbon-carbon composite, and Stover teaches the claimed process steps, the process of Stover would have inherently produced the claimed advantages unless essential process steps and/or limitations are missing from the applicant's claims.

Claim 63-64: Block discloses using a magnesium nitrate as a known oxidation inhibiting compound and therefore using such would have led to predictable results.

6. Claims 1-4, 8-10, 14-23, 25, 26, 27, 57, 59-61, 65 are rejected under 35 U.S.C. 103(a) as being unpatentable over by Stover (United States Patent 5,759,622) in view of Paxton (US Patent 3342627).

Stover teaches all that is discussed above in section 4, however, Stover does not teach the method wherein the additional metal salt comprises an alkaline earth metal salt. However, Paxton, teaching of a known and suitable method for inhibiting oxidation of carbon composites discloses including in a solution of phosphoric acid mixtures of phosphates, including aluminum phosphate, magnesium phosphate, and zinc phosphate (Column 2, column 3, lines 45-48). Therefore, it would have been obvious to one of ordinary skill in the art to have modified Stover to substitute the magnesium phosphate for the disclosed zinc phosphate with a reasonably expectation of successful and predictably results of inhibiting the corrosion of the carbon composite because Paxton discloses both magnesium phosphate and zinc phosphate can be mixed with aluminum phosphate to form a oxidation resistant coating.

Claims 2-3, 8-10, 14-23, 25, 26, 27, 57, and 59-61: The limitations of these claims are rejected for substantially the same reasons as set forth in paragraph 4 above and in combinations with the teachings of Paxton.

Claim 65: Paxton discloses using a boron and iron material in known oxidation inhibiting composition and therefore using such would have led to predictable results.

7. Claims 1-4, 8, 11-23, 25, 26, 27, 57, 59-61, 66 are rejected under 35 U.S.C. 103(a) as being unpatentable over by Stover (United States Patent 5,759,622) in view of Chiu (US Patent 4726995).

Stover teaches all that is discussed above in section 4, however, Stover does not teach the method wherein the additional metal salt comprises an alkaline earth metal salt. However, Chiu, teaching of a known and suitable method for inhibiting oxidation of carbon composites discloses including in a solution aluminum phosphate and magnesium chloride (Column 4, column 3, lines 45-48). Therefore, it would have been obvious to one of ordinary skill in the art to have modified Stover to include magnesium chloride with a reasonably expectation of successful and predictably results of inhibiting the corrosion of the carbon composite because Chiu discloses magnesium chloride can be mixed with aluminum phosphate to form an oxidation resistant coating.

Claims 2-3, 8-10, 14-23, 25, 26, 27, 57, and 59-61: The limitations of these claims are rejected for substantially the same reasons as set forth in paragraph 4 above and in combination with the teachings of Chiu.

Claim 66: Chui discloses using magnesium chloride hexahydrate (Column 4) in known oxidation inhibiting composition and therefore using such would have led to predictable results.

8. Claim 24 is rejected under 35 U.S.C. 103(a) as being unpatentable over Stover in view of Block and further in view of Galasso, et al. (United States Patent 4,425,407, hereafter Galasso).

Regarding this Claim, Stover in view of Block does not teach the method wherein the barrier coating is formed by reacting the carbon-carbon composite with molten silicon. Galasso teaches, in Column 2, lines 56 – 64, that "carbon-carbon composites may be protected from oxidation by converting the surface of the material to an oxidation resistant material. One commonly used family of coating processes utilizes silicon to convert the surface of carbon-base materials to silicon carbide. For example, the carbon-carbon composite material may be dipped in or otherwise contacted with molten silicon or exposed to silicon vapor to cause the surface of the material to converted to silicon carbide." Therefore, it would have been obvious to one having ordinary skill in the art at the time of the present invention to have modified the method taught by Stover in view of Block by forming the silicon carbide barrier coating by reacting the carbon-carbon composite with molten silicon as taught by Galasso, because Galasso teaches that such a method of forming a silicon carbide coating on a carbon-carbon composite is well known in the art.

9. Claim 24 is rejected under 35 U.S.C. 103(a) as being unpatentable over Stover in view of Paxton and further in view of Galasso, et al. (United States Patent 4,425,407, hereafter Galasso).

Regarding this Claim, Stover in view of Paxton does not teach the method wherein the barrier coating is formed by reacting the carbon-carbon composite with molten silicon. Galasso teaches, in Column 2, lines 56 – 64, that "carbon-carbon composites may be protected from oxidation by converting the surface of the material to an oxidation resistant material. One commonly used family of coating processes utilizes silicon to convert the surface of carbon-base materials to silicon carbide. For example, the carbon-carbon composite material may be dipped in or otherwise contacted with molten silicon or exposed to silicon vapor to cause the surface of the material to converted to silicon carbide." Therefore, it would have been obvious to one having ordinary skill in the art at the time of the present invention to have modified the method taught by Stover in view of Paxton by forming the silicon carbide barrier coating by reacting the carbon-carbon composite with molten silicon as taught by Galasso, because Galasso teaches that such a method of forming a silicon carbide coating on a carbon-carbon composite is well known in the art.

10. Claim 62 is rejected under 35 U.S.C. 103(a) as being unpatentable over Stover in view of Block, Paxton, or Chui and further in view of Mercuri et al. (United States Patent 5981072 hereafter Mercuri).

Stover in view of Block, Paxton, or Chui is applied here for the same reasons as applied above, but fails to disclose including nitric acid in the solution. However, Mercuri discloses an oxidation and corrosion resistant carbon material by treating the carbon material using a nitric acid, phosphorous and phosphate comprising solution

(examples, column 2). Mercuri discloses including additional metal salts, such as iron chloride (column 2). Therefore, taking the references collectively, it would have been obvious to one of ordinary skill in the art to include into the solution nitric acid because such is taught as a known and suitable component to provide oxidation resistance in carbon.

***Conclusion***

11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to DAVID TUROCY whose telephone number is (571)272-2940. The examiner can normally be reached on Monday-Friday 8:30-6:00, No 2nd Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Timothy Meeks can be reached on (571) 272-1423. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/David Turocy/
Patent Examiner, Art Unit 1792